Gemeente Amsterdam



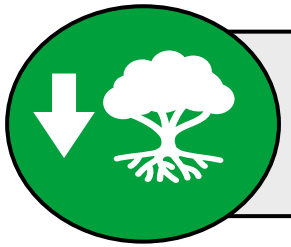
# Improving Amsterdam's Soil Health
# From Index to Action

# Sophia Kambakhsh

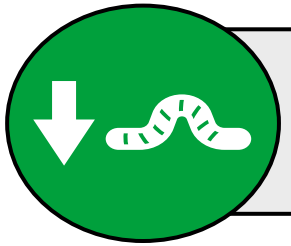
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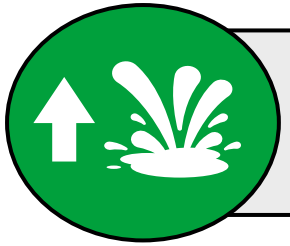
# Reason for developing the BGI-Amsterdam



Declining quality of urban green spaces and parks



Declining (subsurface) biodiversity



Increasing waterlogging after rainfall.

Possible causes:

- Climate change (drought, heat, heavy rainfall)
- Soil compaction



# European, national and local ambitions

## European Soil Strategy 2030/2050 (Monitoring Directive)

*By 2050, all soil ecosystems in the EU must be in a healthy state. The protection, sustainable use and restoration of soil must be the norm by 2050*

Ministry of Foreign Affairs, European Commission presents updated soil strategy, 2021

## National Water and Soil Management Programme

*In addition, measures will be introduced to reduce the amount of soil cover – for example, by using fewer paving stones in the city. Less soil cover leads to healthier soil, better heat management and less flooding.*

Central Government, Cabinet makes water and soil key factors in spatial planning decisions, 2022

## Amsterdam 2050 Environmental Vision

*A city that is prepared for the effects of climate change: heatwaves, droughts, waterlogging and flooding.*

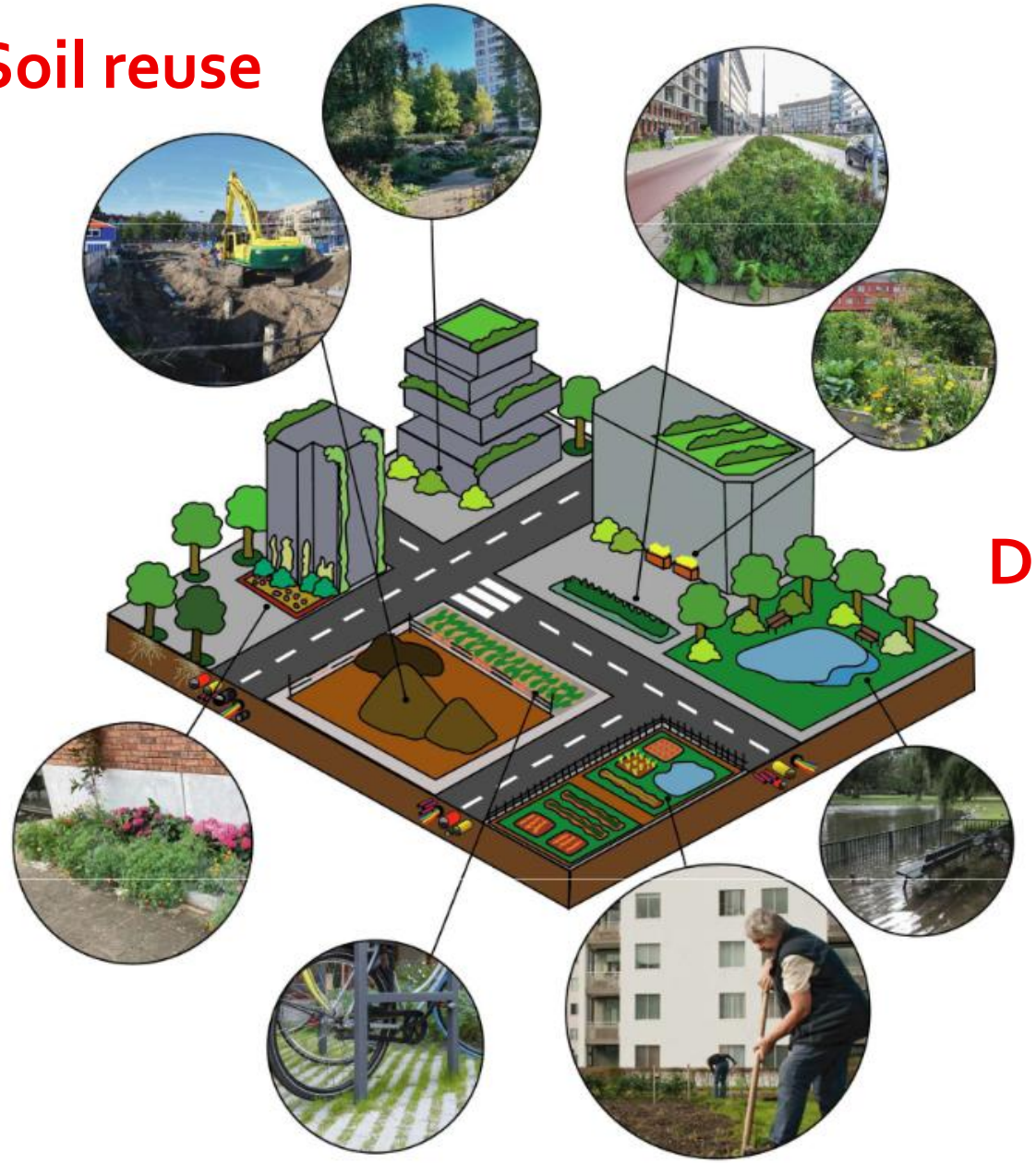
City of Amsterdam, Follow the policy: environmental vision, 2021,

# Use of the Index for multiple purposes

Soil reuse

Design

Restore/improve





# Design




# Pilot: Soil for the neighbourhood

- Which indicators are performing well or poorly?
- Which soil types should you retain, and which should you adjust?
- What type of vegetation is best suited to the soil?
- How can you improve the soil?
- Also give some thought to management and maintenance.

# General advice & Results



- Adjust land use to soil conditions
- Protect existing healthy soils
- Remove sealed surfaces
- Reports for residents with tips



# Soil improvement



# Pilot: Soil-driven greening

- If greenery is not thriving > assess the situation first, then decide on remedial action.
- Should the soil be amended or the planting adjusted?
- Advice to improve soil (example soil compation)
- Adapt vegetation to soil conditions




# Soil reuse

# Which indicators do you measure?











| BGI indicator |
| --- |
| Organic matter content (SOM) |
| Texure |
| ~~Penetration resistance~~ |
| ~~Infiltration capacity~~ |
| ~~Porosity~~ |
| ~~Water holding capacity~~ |
| ~~Dry bulk density~~ |
| Acidity (pH) |
| Conaminants and Soil Pb content |
| Nutrients |
| Salinity (EC) |
| Nematodes, total number |
| Nematodes, plant parasitic number |
| Bacterial biomass |
| Fungal biomassa |
| Earthworms, total number |



# Pilot: From stockpiled soil to soil formation

- Recovery of physical indicators following application

- Accelerating recovery through the use of green manures

- 3 plots:

1 plot with alfalfa *(Medicago sativa)*;
1 plot with Tufted vetch *(Vicia cracca)* Bristle oats *(Avena strigose)*;
1 control plot where pioneer vegetation is growing

- Measurements are taken to assess the effects of the green manure crops on the soil



# Any questions?